

## NOTES.

FOR the meeting of the British Association for the Advancement of Science, which is to be held this year at Portsmouth on August 30 and following days, under the presidency of Sir William Ramsay, K.C.B., F.R.S., the following presidents have been appointed to the various sections:—Mathematical and Physical Science, Prof. H. H. Turner, F.R.S.; Chemistry, Prof. J. Walker, F.R.S.; Geology, A. Harker, F.R.S.; Zoology, Prof. D'Arcy W. Thompson, C.B.; Geography, Colonel C. F. Close, R.E., C.M.G.; Economic Science and Statistics, Hon. W. Pember Reeves; Engineering, Prof. J. H. Biles; Anthropology, Dr. W. H. R. Rivers, F.R.S.; Physiology, Prof. J. S. Macdonald; Botany, Prof. F. E. Weiss, with W. Bateson, F.R.S., as chairman of the Sub-section of Agriculture; Educational Science, Rt. Rev. J. E. C. Welldon, formerly headmaster of Harrow School.

IN December, 1910, a circular, signed by Profs. R. Meldola and W. J. Pope, was sent to a certain number of the Fellows of the Royal Society inviting subscriptions to a fund for the purchase of a portrait of Sir William Crookes, by Mr. E. A. Walton, of the Royal Scottish Academy. We learn that the necessary fund, of which Lord Avebury is treasurer, has now been raised, and that the portrait will be presented to the Royal Society at a meeting of the subscribers to be held at Burlington House on February 16.

AT the annual general meeting of the Royal Astronomical Society, to be held to-morrow, February 10, the gold medal of the society will be presented to Dr. P. H. Cowell, for his contributions to the lunar theory and gravitational astronomy.

AS Prof. Karl Pearson is unable to lecture at the Royal Institution on March 3, the Friday evening discourse on that date will be delivered by Dr. F. A. Dixey, his subject being "Scents of Butterflies."

THE Reale Accademia dei Lincei has unanimously elected King Victor Emmanuel honorary president, in recognition of his work on Italian coins, the "Corpus Nummorum Italicorum."

TO the list of names of honorary foreign members of the French Chemical Society, published in our last week's issue (p. 448), should be added Profs. S'vante Arrhenius, of Stockholm, and G. Ciamician, of Bologna. In the same paragraph, for "Cannizaro" read "Cannizzaro."

THE death is announced from Paris, in his seventy-first year, of Dr. Achille Kelsch, member of the French Academy of Medicine, and known by his work in epidemiology and diseases peculiar to warm climates.

THE Association of Economic Biologists will hold its tenth general meeting at Birmingham, in the University buildings, Edmund Street, under the presidency of Prof. Geo. H. Carpenter, on April 6 and 7. Non-members wishing to attend may obtain particulars from the joint honorary secretary, Mr. Walter E. Collinge, 59 Newhall Street, Birmingham.

MR. HUGH CHISHOLM, editor of the new edition of the "Encyclopædia Britannica"; Mr. F. W. Dyson, F.R.S., Astronomer Royal; and Surgeon-General Sir Alfred Keogh, K.C.B., Rector of the Imperial College of Science and Technology, have been elected members of the Athenæum Club under the provisions of the rule which empowers the annual election by the committee of a certain number of persons "of distinguished eminence in science, literature, the arts, or for public services."

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THE systematic study of the megalithic and other remains in a district is a promising field of work for members of local scientific societies. We are glad, therefore, to see that in one of the papers to be read before the Cotteswold Field Naturalists' Club on February 14 at the Technical Schools, Gloucester, Dr. A. M. McAldowie will deal with "An Astronomical Study of the Long Barrows on the Cotteswolds, with Special Reference to the Meridian."

AT a general monthly meeting of the members of the Royal Institution on January 6, the treasurer reported that he had received 1200*l.*, part of the legacy to the Royal Institution of the late Miss Wolfe, and 62*l.* 10*s.*, a portion of the legacy of the late Mr. C. E. Layton. The special thanks of the members were returned to Dr. J. Y. Buchanan for his donation of 100*l.* to the fund for the promotion of experimental research at low temperatures. The institution has recently received a gift of 1000*l.* from Dr. Hugo Müller.

THE services rendered to forestry in the State of Vermont by Dr. Lewis Ralph Jones have been recognised in an exceptional way by the decision that the new forest reserve shall be called the "L. R. Jones State Forest." Dr. Jones was professor of botany at the University of Vermont from 1889 until he resigned the post last year to accept the chair of plant pathology at the University of Wisconsin. During this period he secured the establishment of the State forest nursery and the creation of the position of State forester, besides promoting in other ways the movement for better forest management.

THE Manchester Museum has recently received, through the generosity of Mrs. Leo Grindon, the important and extensive private herbarium formed by the late Mr. Leo Grindon, who was well known in Manchester as an enthusiastic botanist and teacher, as president of the Field Naturalists and Archæological Society, and as lecturer in botany in the Medical School until its incorporation with the Owens College. The herbarium is arranged on somewhat unique lines, for each plant is accompanied by numerous coloured and other illustrations, together with much valuable printed matter in the form of cuttings from various botanical books and periodicals. The herbarium is rich in specimens of garden plants, and affords valuable evidence of the effects of cultivation on various species. The gift is greatly valued by the committee and the University authorities, not only as a specially valuable instrument in botanical teaching, but also as a memorial of a Manchester citizen who was a distinguished teacher, and inspired much affection in the wide circle of his acquaintance.

GREAT interest attaches to an account, by Dr. E. Trouessart, in *La Nature* of January 14, of the reported discovery in the Congo of a new mammal, which appears to be known to the natives as the "water-elephant." A herd of five of these animals was seen by Mr. Le Petit, one of two explorers sent by the Paris Museum of Natural History, on the northern shore of Lake Leopold II. Before the animals plunged into the lake, Mr. Le Petit had the opportunity of seeing that they were smaller than elephants—their height being estimated at 6 feet—with much shorter trunks, smaller ears, relatively longer necks, and apparently no tusks. Their footprints are also different from those of elephants. In an interview accorded to a reporter of *The Daily Express*, recorded in that journal of February 6, Dr. Chalmers Mitchell expressed his belief in the authenticity of the discovery, and suggested that the apparently new animal might represent

a primitive type of elephant. In this connection, it may be pointed out that Mr. Le Petit's description of the animal accords almost exactly with the restoration of *Palaeomastodon*, of the Lower Tertiary of the Fayum, given by Dr. C. W. Andrews on p. 22 of the "Guide to the Elephants in the British Museum, Natural History." The members of that genus are there stated to range in height from 4 to 6 feet.

MR. GEORGE GREY, whose death at the Nairobi Hospital on February 3, as the result of wounds received from a lion, will be widely lamented in geographical and mining circles, as well as by his many personal friends. His exploratory work as a mining engineer is of scientific as well as commercial value, the discovery and location of the great mineral belts in North-western Rhodesia and the Katanga district of the Belgian Congo being due to him. Eleven years ago Mr. Grey mapped out a hundred copper mines from Kasanschi to the Kambone, as well as the alluvial goldfields of Rüwe, rich tin areas, and other valuable minerals, controlled by the Tanganyika Concessions Company. His work added to geographical knowledge and opened up a vast region to mining, commercial, and pastoral enterprises.

PROF. D. OLIVER, F.R.S., who completed his eightieth year on February 6, was an active contributor to botanical literature during his tenure of the position of keeper of the herbarium and library at Kew Gardens, which he vacated more than twenty years ago. His earliest paper in this connection was an article on the Indian Species of *Utricularia*, published in the *Journal of the Linnean Society*, vol. iii., in 1859. Among his numerous subsequent publications, the more important have been:—*The Atlantis Hypothesis in its Botanical Aspect* (1862); *On the Distribution of Northern Plants* (1862); *The Structure of the Stem in Dicotyledons*, part i. (1862); part ii. (1863); *Notes on the Lorantheæ*, with a Synopsis of the Genera (1863); *Lessons in Elementary Botany* (1864), reprinted at frequent intervals, with a new edition in 1881; *Flora of Tropical Africa*, vol. i. (1868); vol. ii. (1871); vol. iii. (1877); *First Book of Indian Botany* (1869); *The Botany of the Speke and Grant Expedition*, part i. (1872); part ii. (1873); part iii. (1875); *Enumeration of Plants Collected by V. Lovett Cameron*, Lieut. R.N., in the Region about Lake Tanganyika (1876); *List of Plants Collected by Mr. Joseph Thomson on the Mountains of Eastern Equatorial Africa* (1885); with many other papers of great value on African and Arctic plant collecting especially. The excellent quality of Prof. Oliver's work is well known; the high appreciation in which it is deservedly held may be gathered from the fact that, in 1884, the Royal Society bestowed on him one of its Royal medals, and in 1893 he was awarded the Linnean medal—the highest honour it can bestow—by the Linnean Society.

At a special general meeting of the Geological Society of London on January 25, the following resolutions were passed:—(1) That the space now occupied by the museum be made available for the extension of the library. (2) That it is desirable that the society's collections of fossils, minerals, and rocks, with certain exceptions to be subsequently specified, be offered to one or more of the national museums, provided that guarantees be obtained that the specimens will be properly registered and rendered available for scientific purposes. (3) That it is not desirable that the society should accept money for any part of the collections, or in consideration of them. (4) That the council be empowered to approach such institution, or institutions, with the view of carrying the

above resolutions into effect, and that the council shall call another special general meeting to express approval or otherwise of the arrangement proposed.

A copy of the prize programme of the *Société Batave de Philosophie expérimentale de Rotterdam* for 1910 has reached us. In it some forty-eight questions are propounded, and answers are invited which have necessitated research work. The gold medal of the society, or its monetary value, as the author of the selected thesis may decide, will be awarded to the reply which is selected by a general meeting of members of the society. Memoirs should reach the principal secretary of the society not later than February 1, 1912, and should be in Dutch, French, German, or English, and not in the author's handwriting. The memoirs which are awarded prizes will be printed and published by the society, and twelve copies will be offered to each author. The questions for solution range over most branches of science. A few examples of the great diversity of subjects proposed are:—an experimental research on the cause of phosphorescence, particularly in lowly organised animal forms; an experimental study of the electrical properties of some metallic alloys; and an experimental determination, carried out with the greatest care, of the atomic weight of at least one element.

SIR BOVERTON REDWOOD, chairman of the Chemical Industries Committee, Board of Trade (Exhibitions Branch), announces in a circular letter that in the British section of this year's Turin Exhibition chemical and physical apparatus will be shown in a practical and novel manner. Generally speaking, no means are provided at exhibitions for demonstrating the utility of the instruments exhibited, and it has been decided to improve upon this plan by showing apparatus as it would be used in a laboratory. Arrangements are being made by which, it is anticipated, there will be on view at Turin at least two well-equipped chemical laboratories, with such work going on as will illustrate various processes. There will be a large space available for the display of chemical products and apparatus not in use in the laboratories. In the court devoted to scientific instruments, arrangements are in hand for the display of apparatus ready for work, electric supply, where needed, being provided. The equipment of a large dark-room is under consideration, and here it is proposed to show apparatus, such as oscillographs, spectroscopes, optical lanterns, and photometers. The organisation of these exhibits has been placed by the Exhibitions Branch of the Board of Trade in the hands of Dr. F. Mollwo Perkin, under the direction of a joint subcommittee of the Chemical Industries Committee and the mathematical and Scientific Instruments Subcommittee.

SINCE the report of the British Science Guild on the synchronisation of clocks was issued, the following additional information, showing how the post office are extending their operations, has been sent to the committee by the post office representative:—The post office has had a system of synchronisation in perfectly successful operation at Leeds and Birmingham post offices for the past eighteen months. In the former case, the system has been utilised for the correction of a large four-faced turret clock, and, of course, in both cases the system controls clocks exposed, as at all post offices, for public purposes, over the posting boxes and in the public offices. The system has been so successful that arrangements are being made for the clocks at the following post offices to be similarly dealt with:—Aberdeen, Belfast, Bristol, Glasgow, Manchester, Newcastle-on-Tyne, and Liverpool.

At Aberdeen (where electric clocks on the magneta system are already installed, in which case it is, of course, only necessary to synchronise the master clocks) the synchronising system has been extended by open wires to the clocks at certain branch post offices. Further, at Sheffield an electric-clock system driven by a synchronised master clock, which controls (in addition to the ordinary public clocks referred to above) a large double-dial bracket clock fixed outside the building, has been erected. A similar system is about to be installed at Taunton. It is hoped that before very long the post office will be in a position to offer facilities to the public for the synchronisation of clocks at such rental rates as should remove the main objections which have been urged to the general adoption of the principle.

IN connection with the subject of the synchronisation of public clocks, it is of interest to record that a time ball 4 feet in diameter has been provided on the summit of the dome of Messrs. S. H. Benson's building on the west side of Kingsway, and the ball is dropped at each hour by electric current. Unlike time balls which only work once a day, and require to be set up by hand daily before their fall, this one is wound up quite automatically by an electric motor shortly before each hour of daylight, and is released precisely at every hour by the Greenwich time signal. It was laid down as a condition by the architects that there should be no shock or jar occasioned by the fall, and this has been overcome by a system of counterbalancing, whereby the acceleration due to gravity is neutralised just before the ball reaches the bottom. The installation was designed by Mr. Hope-Jones, and carried out by the Synchronome Company, of 32-34 Clerkenwell Road, E.C.

A DEFINITE step towards the reorganisation of the irrigation of Mesopotamia, so long neglected, has been taken by the signing of a contract between the Turkish Government and the firm of Sir John Jackson (Ltd.), contractors and engineers, Westminster, for the construction of a large dam at the head of the Hindia canal, as reported in daily papers on January 31. This is a portion of the comprehensive scheme put forward by Sir William Willcocks, and has for its object the turning back of the waters of the Euphrates into its own bed instead of flowing down the Hindia canal, whereby a large area of country has become waterlogged. By this scheme water will be restored to the Euphrates channel, which is now dry in summer, and prosperity both on its bank and in the present marshy tracts along the Hindia canal will be greatly increased.

OF the four quarter days of the old May year, Candlemas Day, February 2, has become less marked than the rest. It would appear, however, from the following communication to *The Daily Mirror* that it is yet observed in Holland:—"Scheveningen (Holland), Thursday.—To-day is Woman's Day in Holland. Her slipper is in the ascendant. Your Dutch 'vrouw' is no believer in suffragette dreams of equality, no clamant seeker after votes for her sex. Only on one day in the year, February 2, she claims absolute autocracy. For that one day she is lord and master (baas). On awakening, mynheer discovers his wife's slippers hanging conspicuously and ominously over his head. Throughout the day she flaunts her brief spell of emancipation in his face, and in the evening she gives a 'feast,' and then coquettes and contradicts and teases the very life out of him. At the end of the evening he gets his reward. The slipper domination is at an end. She acclaims him her king, her all-in-all baas, and crowns him with flowers and gladly slips back into her position as wife and lover."

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THE port of Hull is shortly to have a fisheries museum, which will be appropriately situated in the western division of the city, where the population and manufactures are closely connected with the steam-trawl fishing industry; the cost of the building will be defrayed by Mr. C. Pickering. A suitable site has been granted in the new Pickering Park, and the Hull Museums Committee hope for the cooperation of the owners of fishing vessels, &c. The nucleus of the collection will be the fine collection of models of fishing methods and appliances, and preserved specimens, recently presented to the Hull Corporation by the Japanese Government. These specimens are all excellently made and are of great interest. It is suggested that the museum should illustrate the growth and evolution of the fishing and shipping industries at Hull, and fishes, both from a natural history and an economic point of view. Mr. Pickering has undertaken to help with regard to models of various types of trawlers, specimens of representative fish, &c. Such an institution should be of great educational value to Hull.

A COMMUNICATION from Sir Harry Johnston, published in *NATURE* of December 15, 1910, to the effect that three living okapis were then on their way to New York, is stated in the *Field* of January 28 to be incorrect. In answer to an inquiry from that journal, the acting director (Dr. H. Townsend) of the American Museum of Natural History—to which institution the specimens were reported to belong—states that no live okapis have been secured by the museum collector in the Congo. We submitted the note in the *Field* to Sir Harry Johnston, who replies as follows:—"I have nothing to add to my original statement or to the remarks on it in the *Field* of January 28 except to say that Dr. Bumpus, of the Natural History Museum, New York, did in a letter of last October give me the information regarding the capture of living okapis, which I quoted textually in my review in *NATURE*. I am sure Dr. Bumpus made the statement on good foundation. My review did not appear immediately it was sent in, consequently the announcement when published was a little old. What is really wanted by science is not any more mounted *skins* of okapis, but the whole carcase preserved for the careful dissection of the soft parts. This is even more important than the exhibition of live okapis as a curiosity."

THE Lord Mayor presided over a public meeting, held in the Guildhall on February 6, to consider the desirability of the systematic destruction of rats and other vermin in the interests of the public health as well as in those of agriculture and commerce. In moving a resolution to this effect, Sir James Crichton-Browne referred to the danger from plague-infected rats, and remarked that while there is no cause for panic, on account of the outbreak in Suffolk, there is cause for anxiety so long as any rats carrying the plague bacillus remain in the land. The following resolution was also adopted upon the motion of Sir Charles McLaren, seconded by Prof. G. H. T. Nuttall:—"That urgent representations be made to the Government as to the necessity for the immediate appointment of a Royal Commission for the purpose of inquiring into (1) the increase of vermin and the steps to be taken for their destruction; (2) the question of what creatures are or are not harmful to man and his industries; and (3) the safety and efficiency of the various viruses on the market and other means advocated for such destruction." It was decided to ask the council of the Royal Institute of Public Health to take steps to give effect to the resolutions adopted by the meeting.

HIS MAJESTY'S battleship *Thunderer* was launched on Wednesday, February 1, from the yard of Thames Iron Works, Ltd. As this ship is the largest floated for the British Navy up to the present, the builders have to be congratulated on the enterprise and courage which has enabled them to overcome the difficulties inherent to the building of ships on the Thames. When finished, the new ship will have a displacement of 22,500 tons; her length is 545 feet and her breadth 88 feet 6 inches. Parsons' turbines, to give a speed of 21 knots, are being constructed at the builder's works at Greenwich. The launching weight of the vessel and cradles was about 9600 tons, and the ways were so designed as to keep the pressure under 2 tons per square foot. The inclination of the ways was 1 in 16, and about 10 tons of tallow, together with oil and soft soap, were used for lubrication. The launching operation passed off without hitch of any kind, and the vessel was immediately towed down the river to Dagenham, where the firm have had constructed a new ferro-concrete jetty for the purpose of enabling the ship to be finished.

A REPORT has just been published by Mr. F. Palmer, chief engineer to the Port of London Authority, in which is described a very comprehensive scheme for the improvement of the Port of London. In a summary of the report, *Engineering* for February 3 states that the net tonnage entering the Port of London has increased in recent years at the rate of about three million tons every ten years. The maximum size of vessels using the port has increased from 10,000 to 14,000 tons. The new scheme in its entirety will cost about 14,500,000*l.*, and provides, among other improvements, for four new docks and rearrangements and reconstruction for those at present in existence. The depth of water in all will be increased, and from the Millwall Docks seawards there will be a channel 600 feet wide, giving 20 feet at low tide and 41 feet at high tide. Just above the Albert Docks this will change to a channel of corresponding width, but of 10 feet greater depth, while a little lower it opens out to 1000 feet in width. As all the best docks at present are fully occupied, but little additional tonnage can be attracted except by the provision of new or improved facilities, and there seems little doubt that many of the suggested improvements will be carried out in the near future.

In *The Times* of February 3 a correspondent says that another attempt to cross the Atlantic Ocean by airship will be made early this year. The enterprise is being promoted by a German syndicate, and it is reported from Kiel that the airship, named the *Suchard*, is practically complete, and will, after trials, be shipped to St. Vincent, Cape Verde Islands. The *Suchard* differs essentially from the Wellman airship. The gas envelope is constructed more or less on the lines of the Parseval dirigible, but it is of stouter material. In length it is 195 feet, and its greatest diameter is 55 feet. The cubic capacity is 9400 cubic metres, and an abnormally large air ballonnet is fitted. Care has been taken to devise a system of balancing which will keep the vessel as nearly as possible at a uniform height. The motive power will be supplied by two petrol engines of 200 horse-power, mounted in a boat slung beneath the envelope. In the event of mishap to the envelope, necessitating its being cut adrift, the motors can be employed to propel the boat. The entire power plant and all the stores are to be placed in this boat. A light upper deck or platform is situated above the boat of the *Suchard*, which gives access to the envelope. The promoters claim that they will be able to cross the Atlantic in three ways, namely, by

the dirigible, with the engines running and the trade winds helping; by balloon, in the case of the failure of the engines; or by motor-boat.

AN article by Prof. G. H. Bryan in the *Cornhill Magazine* for February deplores the loss of life by aeroplane accidents, and suggests that the trial-and-error methods by which the development of aerial navigation has been accomplished do not provide the quickest or the best means of solving the problem of stability or of producing machines by which the difficulty of flying will be reduced to a minimum. "The difficulty of flying straight," he remarks, "has been overcome, not by a complete investigation of the problem of stability and the consequent construction of stable aeroplanes, but by aviators learning to balance themselves on more or less unstable machines." Work is wanted in the laboratory, and experiments with models in the air, to provide the material required for the mathematical solution of the problem of maintaining equilibrium in the air under various conditions. While many valuable money prizes are offered for successful flights, practically no encouragement is given to any mathematical or other purely scientific investigator to devote one or two years of fairly continuous work to the study of the stability of motion of an aeroplane. There are plenty of mathematicians who are admirably equipped for such an investigation, but the pressure of their everyday duties, or the necessity of earning a modest livelihood, prevents them from undertaking the work except in their spare time. Prof. Bryan himself, working with Mr. Harper, finds that in ordinary circumstances "a machine is less liable to overturn by pitching, but some machines are more liable to overturn sideways when gliding downwards than when flying horizontally." He considers that most machines at present in use are more or less unstable laterally, and that the methods by which progress has been achieved have involved—to use the title of his article—unnecessary "Wastage of Men, Aeroplanes, and Brains."

THE report of the Public Health Committee of the London County Council, containing the report of the medical officer of health of the county, Sir Shirley Murphy, for the year 1909, has recently been issued. It contains a mass of statistical matter of the utmost value, as well as several special reports by the assistant medical officers on subjects of importance in public health. Of the latter, Dr. Hamer's on nuisance from flies and on the seasonal prevalence of vermin in common lodging-houses is of particular interest. A census of flies in selected localities, the species to which they belong, their seasonal prevalence and relation to intestinal diseases, are discussed.

AN article referring to the Chinese tree originally named *Cupressus Hodginsii*, by Mr. S. T. Dunn, appears in *The Gardener's Chronicle* (February 4). Dr. A. Henry, in consultation with Mr. H. H. Thomas, announces that from an examination of further material they make it the type of a new genus, *Fokienia*, intermediate between *Cupressus* and *Libocedrus*. It agrees with *Cupressus* in the shape of the female cones, and is similar to *Libocedrus* in the unequally-winged seeds and general characters of the foliage. Another announcement in the same issue relates to the discovery in a Dutch nursery of a fertile sport of the maidenhair fern *Adiantum Farleyense*, often mentioned for its sterility, *i.e.* non-production of spores. The new variety is said to be superior in other respects, inasmuch as it thrives at a lower temperature and bears the petioles more erect and rigid.

THE difficulty of producing definite proof even for elementary physiological principles is exemplified in the two articles on the translocation of carbohydrates in plants contributed by Mr. S. Mangham to *Science Progress* (October, 1910, and January, 1911). Formerly the opinion was generally accepted that, while albuminous substances pass through the sieve-tubes, the carbohydrates travel chiefly, if not entirely, through the parenchymatous cells of the vascular bundle. In 1897 Czapek enunciated the view, which is here affirmed, that the sieve-tubes furnish the path for rapid translocation of the assimilates as a whole. The problem is discussed both with regard to the structure of the conducting tissues, more especially of the small veins in the leaf, and the results of physiological experiments. The weightiest arguments are derived from the interpretation of Schubert's examination of the leaf-veins and the author's experiments for tracing the sugars in the tissues by the formation of osazones. The latter method is only briefly indicated, but further details of the process and results are promised; meantime, the author is justified in stating that he has furnished strong evidence in favour of Czapek's theory.

WE have received the Almanac for 1911 published by the Survey Department of Egypt. It has increased in size, and contains a large amount both of statistical and general information concerning Egypt and the Nile basin. Much information relating to such important matters as taxation, areas of jurisdiction, &c., which is not always readily accessible to the public, is here included.

In the report upon the rains of the Nile basin and the Nile flood of 1909, published by the Survey Department of Egypt, Mr. J. I. Craig gives full details of the rainfall and its effect on different parts of the river system. He points out that certain anomalous variations of the level of Lake Victoria in 1908 have been definitely traced to instability of the gauge at Jinja, and are not to be connected with possible crustal movements. The number of stations has increased, there being now 96 in Egypt and the Sudan, while data from 121 other stations in surrounding regions are utilised. In a final chapter he summarises recent investigations into the possibility of predicting the character of the flood.

In the January number of the *Geographical Journal* Prof. T. Park describes the area affected by the Tarawera eruption in New Zealand in 1886, its erosion since that date, and the development of new vegetation. The sheet of grey ash which then covered the dissected tableland on the shores of Bay of Plenty has now been deeply scored by rain, and many points of interest, such as the distribution of the black andesitic ash, may now be seen. Since 1890 the growth of vegetation, mainly bracken, tutu, veronica tree fern, blue gum, and acacia, has been rapid, some of the gum trees being now more than 30 feet high.

To the Bulletin of the St. Petersburg Academy of Sciences of December 1, MM. Dudetzky and Weinberg communicate a short paper on the microstructure of hailstones. These were collected during a thunderstorm at Tomsk (Siberia) on June 12, 1910, were mostly spheroidal in form, and generally 7 to 10 mm. in size. Their concentric spherical layers were alternately opalescent and transparent, and divided according to the rays by a quantity of air-bubbles, frequently oblong in shape. Many of the stones consisted only of one layer, sometimes quite transparent, in other cases milky. An interesting peculiarity presented itself in some of the stones, formed of several spherical layers, viz., the eccentricity of the milky central grain. This occupied a lateral part of the hailstone, and

often formed but part of a sphere. In the stones examined it was difficult to indicate any relation between their crystalline and physical structure. The only fact that could be drawn from the visual study of the images of the thin plates on a screen was a certain enlargement of the crystalline grains with distance from the centre of the central layer.

ACCORDING to a paper by Dr. L. A. Bauer in the January number of the *American Journal of Science*, it is proposed to take observations of the value of the gravitational acceleration on board the American magnetic ship *Carnegie* during her future voyages, beginning at Cape Town in April next. The method to be adopted is that suggested by Guillaume in 1894, and used on land by Mohn and at sea by Hecker. It consists in the observation of the height of the barometer and the boiling point of water with mercury thermometers of special construction, or with resistance thermometers. The principal difficulty in obtaining accurate results is the "pumping" of the barometer owing to the motion of the ship, and this, it is hoped, will be overcome by the construction and mounting of the instrument. The barometers and thermometers are to be compared at intervals with standard instruments, and observations in port are to be made on land and on water, and are to be compared with the results of pendulum observations wherever it is possible. By these means Dr. Bauer hopes to secure results free from the objections which can be urged against those of Hecker.

THE new convertible Balopticon lantern, of which a catalogue has been issued by the Bausch and Lomb Optical Co., Thavies Inn, London, E.C., is designed for the projection of lantern-slides by transmitted light, opaque objects by reflected light, and for microscopical and vertical projection by the addition of the necessary attachments. The apparatus appears to be very ingeniously devised, as by its aid almost any projection work may be carried out efficiently that would otherwise require much larger and more complex arrangements. It must not be forgotten, however, that the brilliancy of the picture to be obtained with any projection apparatus depends primarily on the power of the source of light, so that the illuminant, particularly for opaque objects, should be an efficient one. In the present instance this point has not been overlooked, and as, in addition, the optical parts are of a high order, the results to be obtained are in every way satisfactory. Each one of the above-mentioned methods of projection may be obtained almost instantly as required, so that for lecture purposes, where objects of a varied character are to be shown, the apparatus can be used with ease.

THE *Builder* for January 27 contains an interesting account of a method of strengthening a bridge by means of sheathing the steel trestles with reinforced concrete. The bridge operated on is that carrying the Wabash Railway over the River Missouri. Originally designed for the moving loads prevalent at the time, the trestles were quite inadequate for modern traffic requirements. After preliminary experiments, all the columns have been converted into octagonal reinforced concrete columns by applying concrete embedding a spiral coil of No. 6 American gauge wire wound with a pitch of 2 inches. The column bases consist of a rectangular concrete block reinforced by a network of steel rods near the outer surfaces. The struts bracing the four columns in each tower have been cased in concrete, the concrete being reinforced by eight half-inch rods, around which is a wrapping of wire netting. The connections between columns and struts are stiffened by reinforced concrete brackets. The concrete used was mixed in the proportions of one part Portland cement to

three parts of coarse sand. Tests conducted at the University of Illinois show that the reinforced concrete column possesses about double the strength of the plain steel column prior to reinforcement.

THE London representative of the firm of E. Merck, of Darmstadt, desires us to say that the "Index" referred to last week (p. 453) can be obtained at the address of the London house, 16 Jewry Street, E.C., and that the price of the book is 6s. 6d.

THE first number of *The Irish Review*, a monthly magazine of Irish literature, art, and science, will be issued next month. The review will be for Ireland what such periodicals as *The Quarterly Review*, *The Edinburgh Review*, *Le Mercure de France*, have been for neighbouring countries. It will compete with no existing periodical, and will publish in its literary pages nothing of merely ephemeral interest. In each number will be an authoritative article on a subject of scientific or economic research as applied to Ireland.

MESSRS. FLATTERS AND GARNETT, LTD., 32 Dover Street, Manchester, have issued two new catalogues. One provides interesting particulars of a series of new lantern-slides, and is supplementary to the catalogue of lantern-slides published by this firm in November, 1909. Attention may be directed specially to the slides illustrating plant associations, by Mr. W. B. Crump; bird photographs from recent negatives; and the reproduction and development of *Pinus sylvestris*. The second list deals with optical lanterns and accessories. One novel item in the latter is a combined lantern-screen and stand which can be erected in two minutes.

### OUR ASTRONOMICAL COLUMN.

NOVA LACERTÆ.—In his note to the Academy of Sciences (*Comptes rendus*, January 23) describing the spectra of Nova Lacertæ secured at the Meudon Observatory on January 15, M. P. Idrac directs attention to the great width and the structure of the bright hydrogen lines.

Each of the hydrogen lines H $\beta$ -H $\epsilon$  extends over about 40 Angströms and in H $\beta$ , H $\gamma$ , and H $\delta$  there are strong maxima at about 12 Angströms from the centre of each band towards the red; the photograph is probably too weak to show them in He and H $\zeta$ . The band at  $\lambda$  464 is as strong as the hydrogen lines, and has hazy borders, its width being about 50 Angströms; there is also a bright line at about  $\lambda$  437.

The spectra secured are too narrow to show absorption lines definitely, but one is suspected on the more refrangible side of H $\gamma$ . Altogether, the spectrum appears to be of the nova rather than of the long-period variable type.

MARS AND ITS ATMOSPHERE.—A number of drawings of the surface features of Mars, reproduced and described in Circular No. 5 of the Transvaal Observatory, are of interest, inasmuch as they represent the observations of two unbiassed observers using a 9-inch refractor under favourable conditions. The observations were made during the latter part of 1909 by Mr. Innes and Mrs. H. E. Wood, and are depicted on forty-two separate discs; Mrs. Wood also contributes a composite map embodying the details seen on her separate sketches.

Mr. Innes saw many fine and elusive shadings, but no "canals," in the usual acceptance of the word, were seen by him. He directs special attention to the two conjugate, diametrical, double canals usually shown crossing Hellas, and states that he was never able to see more than a curious curved shading. On the other hand, Mrs. Wood, in her drawing of October 25 (No. 40) and on the composite map, shows Peneus and Alpheus in their conventional forms.

In Bulletin No. 180 of the Lick Observatory Prof. Campbell and Dr. Albrecht describe the results secured in an attempt to obtain evidence for water vapour and oxygen in the Martian atmosphere by the broadening or duplica-

tion of the corresponding terrestrial lines on large-dispersion spectrograms. As red-sensitive plates are now readily procurable, it was expected that this application of the Doppler-Fizeau principle, which occurred to Prof. Campbell in 1896, might prove fruitful. Spectrograms were secured, some under excellent conditions, in January and February, 1910, with a specially designed grating-spectrograph made at the observatory, and the displacements of the lines carefully measured.

The results indicate that the amount of water-vapour existing in the planet's atmosphere on February 2, 1910, was certainly less than one-fifth that existing above Mount Hamilton, where the air temperature was 0° C., the relative humidity was 33 per cent., and the absolute humidity was 1.9 grams per cubic metre; the zenith distance at mid-exposure was 55°. The amount of oxygen above unit area on Mars was, apparently, also small as compared with that in the earth's atmosphere.

COMETARY THEORIES.—In No. 4466 of the *Astronomische Nachrichten* Messrs. Roe and Graham, of the Syracuse University, suggest a new theory of comets which they believe to be based on phenomena in accordance with modern mathematical physics. Briefly, it is that the sun, as an intensely heated body in which violent chemical action is taking place, emits abundant streams of negative electrons, and so acquires a positive charge. Other bodies, such as the earth and comets, will act similarly under the action of some agent intimately associated with the ultra-violet light radiations which they receive. As the comet approaches the sun, the positive charge will tend to increase, and the mutual repulsion of the charged particles will overcome the relatively small cometary gravity, thus producing streamers away from the comet and the sun. Various associated problems are discussed in the paper, and various desirable lines of research are briefly enunciated.

In No. 4468 of the same journal Prof. Eginitis also discusses the physical constitution of comets as exemplified by the phenomena attending the recent passage of Halley's comet. After May 21, 1910, the tail appeared to be much brighter than before, and Prof. Eginitis attributes this to the fact that then we were looking at it by directly reflected solar light—the side illuminated by the sun's rays was exposed to us. Therefore, he argues, the material composing comets is but slightly luminous, and we only see it clearly when it is acting as a reflector of the solar light. From this it follows that the physical constitution of comets is not purely gaseous—the comet is a mixture of gas with solid corpuscles.

POLARISATION IN THE SPECTRUM OF  $\alpha$  CETI.—When, in 1898, it was found that the bright H $\gamma$  line in the spectrum of Mira was triple, it was suggested that the phenomena might be due to the Zeeman effect produced by magnetic activity in the star. Polariscopic observations were not then possible, and the faintness of Mira in 1899 defeated the preparations made for the maximum of that year.

During the maximum of 1909 preparations were again made at the Lick Observatory, and photographs were secured, but no definite general conclusion accrued. As Dr. Wright explains, in Lick Observatory Circular, No. 183, the whole problem is hedged with grave difficulties, chief of which is that introduced by the possibly considerable changes of direction of the magnetic field in the star. All that can be deduced definitely from his observations is that they show that the multiple character of the lines is not due to a magnetic field maintaining a constant direction throughout the source.

THE EARTH'S ACTION ON SUNLIGHT AND HEAT.—Mr. James D. Roots sends us a pamphlet in which he enunciates a theory to answer the question: "What Becomes of the Sunlight and Heat Absorbed by the Earth?" Mr. Root believes it is converted to "radio-activity, and then by stages of change to electric current," which leaves the earth at the poles, completing a continuous cycle sun to earth, earth to sun. The story is not so continuous, and often consists of such statements as "The main currents rotate the earth," but it is reassuring to learn that Sir J. J. Thomson, in one passage of his "Electricity and Matter," "almost grasps the truth."